

What is claimed is:

1. A fuel filter for removing sulfur-containing compounds from a liquid fuel,
comprising:

a hollow housing body defining a chamber therein;

5 an inlet connected to the housing body and in fluid communication with the
chamber thereof;

an outlet connected to the housing body and in fluid communication with the
chamber thereof;

a filter media disposed in the housing chamber for filtering liquid fuel and for
10 removing sulfur compounds therefrom; the filter media comprising:
a plurality of fibers; and
a sulfur-treating composition operatively associated with the fibers for
reacting with sulfur-containing compounds.

2. The fuel filter of claim 1, wherein the sulfur-treating composition is selected for
15 its ability to react with thiophenes.

3. The fuel filter of claim 1, wherein said filter media fibers comprise a plurality
of shaped fibers having hollow channels formed therein.

4. The fuel filter of claim 3, wherein said sulfur-treating composition comprises a

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DETAILED DESCRIPTION

sorbent material disposed within the hollow channels of the fibers.

5. The fuel filter of claim 4, wherein said sorbent material is selected from the group consisting of activated carbon, zeolites, clay, silica gel, silicon dioxide, aluminum oxide and mixtures thereof.

5 6. The fuel filter of claim 1, wherein the sulfur-treating composition comprises an electron acceptor, and wherein the sulfur-treating composition is adapted to form a coordination complex with a sulfur-containing compound.

7. The fuel filter of claim 1, wherein the sulfur-treating composition comprises a reagent selected from the group consisting of metals, metal oxides, metallic salts,
10 organometallic compounds, catalysts, and oxidizing agents.

8. The fuel filter of claim 4, wherein the sulfur-treating composition further comprises a reagent selected from the group consisting of metals, metal oxides, metallic salts, organometallic compounds, catalysts, and oxidizing agents.

9. The fuel filter of claim 1, wherein the sulfur-treating composition comprises a
15 liquid emulsion.

10. A fuel filter for removing sulfur-containing compounds from a liquid fuel,
comprising:

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a thin-walled hollow housing body defining a chamber therein;

an inlet connected to the housing body and in fluid communication with the chamber thereof;

an outlet connected to the housing body and in fluid communication with the 5 chamber thereof;

a filter media disposed in the housing chamber for filtering liquid fuel and for removing sulfur-containing compounds therefrom; the filter media comprising:

10 a plurality of substrate particles; and

a reagent operatively associated with a plurality of particles selected from said substrate particles, said reagent being capable of reacting with thiophenes.

11. The filter of claim 10, wherein said substrate particles comprise a substance selected from the group consisting of activated carbon, zeolites, clay, silica gel, silicon dioxide, aluminum oxide and mixtures thereof.

12. The filter of claim 10, wherein said reagent is selected from the group 15 consisting of metals, metal oxides, metallic salts, organometallic compounds, catalysts, and oxidizing agents.

13. A system for reducing a concentration of sulfur-containing compounds in a liquid fuel, comprising:

20 a metering pump for adding a precipitating agent to said fuel at a first location; and

a filter for removing a precipitate from said fuel downstream of said metering pump, said filter comprising:

a thin-walled hollow housing body defining a chamber therein;

an inlet connected to the housing body and in fluid communication with
5 the chamber thereof;

an outlet connected to the housing body and in fluid communication with
the chamber thereof; and

a filter media disposed in the housing chamber for filtering precipitate
from said liquid fuel and for thereby removing sulfur-containing compounds
10 therefrom.

14. A method of filtering fuel, comprising the steps of:

a) transferring the fuel from a reservoir through a fuel line and to a fuel filter;

b) treating the fuel by passing it through the fuel filter and over a filter media
housed therein, said filter media comprising a reactant selected for its ability to react with
15 thiophenes and reduce the concentration thereof in said fuel;

whereby the concentration of sulfur-containing compounds in the fuel is reduced.

15. The method of claim 14, wherein the filter media comprises a plurality of
shaped fibers having hollow channels formed therein.

20. The method of claim 15, wherein a plurality of solid particles are disposed
within the hollow channels of the fibers.

17. The method of claim 14, wherein said filter media comprises a plurality of substrate particles comprising a substance selected from the group consisting of activated carbon, zeolites, clay, silica gel, silicon dioxide, aluminum oxide and mixtures thereof.

18. The method of claim 17, wherein said substrate particles are operatively associated with a substance selected from the group consisting of metals, metal oxides, metallic salts, organometallic compounds, catalysts, and oxidizing agents.

19. The method of claim 18, wherein said filter media further comprises a reagent selected from the group consisting of metals, metal oxides, metallic salts, organometallic compounds, catalysts, and oxidizing agents.

10 20. A method of reducing a concentration of sulfur-containing compounds from a liquid fuel, comprising:

adding a precipitating agent to said fuel at a first location between a fuel storage tank and a fuel application, whereby a sulfur-containing compound in said fuel is precipitated out of solution therein; and

15 passing said fuel through a fuel filter to remove said precipitate from said fuel.